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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
CAMPOS, YAIMA	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/827,526	SIMMS, MARK J.	
	Examiner	Art Unit	
	Yaima Campos	2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/14/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having Application No. 10/827,526 has a total of 32 claims pending in the application; there are 8 independent claims and 24 dependent claims, all of which are ready for examination by the examiner.

I. INFORMATION CONCERNING OATH/DECLARATION

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to be defective. A new oath or declaration in compliance with **37 CFR 1.67(a)** identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

3. The oath or declaration is defective because:

It is illegible and does not clearly identify the citizenship of each inventor.

II. STATUS OF CLAIM FOR PRIORITY IN THE APPLICATION

As required bye **M.P.E.P. 201.14(c)**, acknowledgement is made of applicant's claim for priority based on application filed on 4/22/03 (Foreign Priority - United Kingdom 0309026.3).

III. INFORMATION CONCERNING DRAWINGS

Drawings

4. The applicant's drawings submitted are objected to by the examiner.

5. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

IV. ACKNOWLEDGEMENT OF REFERENCES CITED BY APPLICANT

6. As required by **M.P.E.P. 609(C)**, the applicant's submission of the Information Disclosure Statement dated December 14, 2004 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by **M.P.E.P 609 C(2)**, a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

V. OBJECTIONS TO THE SPECIFICATION

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: -- **Data Management Based on Block-Sized Deletions** --.

8. The disclosure is objected to because of the following informalities:

The references to Figure 2 in page 2 (lines 5-12) appear to be erroneously numbered. For example, "206" (line 5) should be **-205-**. The rest of the references in this paragraph also appear to be misnumbered in the same manner. Applicant might consider correcting the numeration on the references to Figure 2 in page 2, lines 5-12.

The word "whilst" (page 3, line 13) appears to be a typographical error. It is believed this word should be **–while-** and has been treated as such for the rest of this office action.

Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

9. Appropriate correction is required.

VI. REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 1-32** are rejected under 35 U.S.C. 102(b) as being anticipated by Marshall et al. (US 5,832,493).

12. As per **claims 1, 7, 26, 28 and 32**, Marshall discloses "A method/apparatus of managing a memory of a device for testing a data storage device, said method comprising:" as **["a method and apparatus for storing data files with a flash memory" (Column 1, lines 5-7) wherein memory management is done for**

"wear leveling" which comprises a form of memory testing (Column 5, lines 51-64 and Column 6, lines 49-56) and explains that the present invention is applicable to any memory type where "erasures are required or desired to be done by blocks" (Column 3, lines 58-64)]

"reading a data block from said data storage device into a block of memory, said memory block comprising a plurality of smaller memory chunks;" **[With respect to this limitation, Marshall discloses that "each erasure block of a flash memory is divided into a number of sectors" (Column 2, lines 31-37, Columns 3-4, lines and Figure 1)]**

"for each said memory chunk, maintaining in real time a record of whether any data stored in said memory chunk is required to be maintained for use by a test program;" **[Marshall discloses this limitation as a "SAT (sector allocation table)" which "includes a SAT record 25 (Fig. 5) for each of the files sectors" (Column 4, lines 31-32) and explains that "each SAT record 25 includes four bits for indicating that the corresponding file sectors 26-29 are free, active (current), pre-discarded, or discarded" (Column 4, lines 38-42 and Figure 5). Marshall also discloses that when sectors are no longer required and their space may be reclaimed by the memory management system, they are marked as "discarded" (Column 5, lines 51-54 and Column 6, lines 49-67)]** "and under a condition of said records indicating that the data in all the memory chunks of said data block need not be maintained for use by said test program, deleting said data block" **[With respect to this limitation, Marshall discloses that "when a file sector 26-29 is discarded, the SAT 24 of the associated erasure block 19 and statistics are updated. If all the file sectors 26-29 in the erasure block**

19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56)].

13. As per **claim 2**, Marshall discloses "The method as claimed in claim 1," **[See rejection to claim 1 above]** "wherein maintaining a record comprises: for each said memory chunk, maintaining flag data indicating the status of data in said memory chunk" **[With respect to this limitation, Marshall discloses; "SAT (sector allocation table)" which "includes a SAT record 25 (Fig. 5) for each of the files sectors" (Column 4, lines 31-32) and explains that "each SAT record 25 includes four bits for indicating that the corresponding file sectors 26-29 are free, active (current), pre-discarded, or discarded" (Column 4, lines 38-42 and Figure 5)]**.

14. As per **claim 3**, Marshall discloses "The method as claimed in claim 1," **[See rejection to claim 1 above]** "wherein maintaining the record comprises: maintaining a count of said memory chunks for which the data stored in said memory chunks is required to be maintained" **[Marshall discloses this concept as "the wear leveling code 74 includes instructions for selecting the erasure block 17-20 for reuse as follows: 1) selecting the erasure blocks 17-20 in which all the file sectors 26-29 have been allocated; 2) from the erasure blocks 26-29 that are completely allocated, selecting the erasure blocks 17-20 with the lowest number of file sectors 26-29 that are active" (Column 5, lines 55-64); therefore, a count of required memory chunks is maintained as the active memory chunks cannot be "discarded." Marshall also teaches maintaining information for the file sectors that are free in each memory block (Column 6, lines 49-56)]**.

15. As per **claims 4, 8 and 10-11**, Marshall discloses "The method as claimed in claims 1 and 7," **[See rejection to claims 1 and 7 above]** "wherein maintaining the record, comprises: maintaining a count of individual said memory chunks for which data stored in memory chunks is required to be maintained;" **[Marshall discloses this concept as "the wear leveling code 74 includes instructions for selecting the erasure block 17-20 for reuse as follows: 1) selecting the erasure blocks 17-20 in which all the file sectors 26-29 have been allocated; 2) from the erasure blocks 26-29 that are completely allocated, selecting the erasure blocks 17-20 with the lowest number of file sectors 26-29 that are active" (Column 5, lines 55-64); therefore, a count of required memory chunks is maintained as the active memory chunks cannot be "discarded." Marshall also teaches maintain information for the file sectors that are free in each memory block (Column 6, lines 49-56)]**
"and maintaining, for each memory chunk, a pointer to a memory block of which said memory chunk forms a part" **[Marshall discloses this concept in figure 1 and explains that "the SAT 24 includes a SAT record 25 (Fig. 5) for each of the file sectors 26-29 where the SAT record 25 having the first physical address within the SAT 24 refers to the file sector 26-29 having the first physical address range within the erasure block 19" (Column 4, lines 31-38); therefore, each sector has a pointer to a memory as each sector has a physical address within a block of memory]**.

16. As per **claim 5**, Marshall discloses "The method as claimed in claim 1," **[See rejection to claim 1 above]** "wherein maintaining the record comprises: maintaining for each memory chunk, a pointer to a memory block of which said memory chunk forms a part;" **[Marshall discloses this concept in figure 1 and explains that "the SAT 24**

includes a SAT record 25 (Fig. 5) for each of the file sectors 26-29 where the SAT record 25 having the first physical address within the SAT 24 refers to the file sector 26-29 having the first physical address range within the erasure block 19" (Column 4, lines 31-38); therefore, each sector has a pointer to a memory as each sector has a physical address within a block of memory]

"and maintaining a pointer to a data chunk stored in said memory chunk" **[Marshall discloses this concept as "in order to consolidate the file sectors 26-29 or to modify the data segment 32, the file sectors 26-29 are copied by the executable code 68 into new address space" (Column 5, lines 65-67); therefore, Marshall discloses a sector having a pointer to its own data as sectors include a data segment (Also see Column 4, lines 48-50)]**.

17. As per **claim 6**, Marshall discloses "The method as claimed in claim 1," **[See rejection to claim 1 above]** "further comprising: generating a message to delete said data block in response to a signal from said test program that no further testing of said data block is required" **[Marshall discloses this concept as "in order to consolidate the file sectors 26-29 or to modify the data segment 32, the file sectors 26-29 are copied by the executable code 68 into new address space. The pre-discard code 72 includes instructions for marking the pre-discarded indicator (Fig. 5) corresponding to the file sector 26-29 before that file sector 26-29 is copied into a new address space and marking the discarded indicator corresponding to the file sector 26-29 after the copy is complete" (Columns 5-6, lines 65-67 and 1-5) and explains that "If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56) by having "asynchronous**

erasures" which "can be initiated by a function call by a flash memory 10 file access function" (Column 7, lines 18-28)].

18. As per **claims 9, 12 and 15**.

"The method as claimed in claims 7 and 13," **[See rejection to claims 7 and 13 above]** "further comprising: determining whether any further testing of said data block is required; and if no further testing of said data block is required, deleting all of said data block" maintaining "flag data indicating whether or not a reader application has finished data processing a data block" **[Marshall discloses this concept as "in order to consolidate the file sectors 26-29 or to modify the data segment 32, the file sectors 26-29 are copied by the executable code 68 into new address space. The pre-discard code 72 includes instructions for marking the pre-discarded indicator (Fig. 5) corresponding to the file sector 26-29 before that file sector 26-29 is copied into a new address space and marking the discarded indicator corresponding to the file sector 26-29 after the copy is complete" (Columns 5-6, lines 65-67 and 1-5); therefore, "discarding" sectors indicates a consolidation and wear-leveling application is done processing this sector and the sector is ready for erasure and explains that "If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56) by having "asynchronous erasures" which "can be initiated by a function call by a flash memory 10 file access function" (Column 7, lines 18-28); as a signal message to initiate file block deletions]**.

19. As per **claims 13 and 29**

"A method/apparatus of managing a memory for maintaining a plurality of data blocks in a memory device, such that said data blocks are made available to at least one reader device which reads data from said data blocks for processing by at least one test component, said method comprising:" **["a method and apparatus for storing data files with a flash memory" (Column 1, lines 5-7) wherein memory management is done for "wear leveling" which comprises a form of memory testing (Column 5, lines 51-64 and Column 6, lines 49-56) and explains that the present invention is applicable to any memory type where "erasures are required or desired to be done by blocks" (Column 3, lines 58-64). Marshall also discloses having "computing machine 60" which includes "executable code 68" for "using the data structure of the flash memory 10 for accessing the data files stored in the flash memory 10 and for controlling the computing machine 60" (Column 5, lines 24-40 and Figure 2) and "temporary memory 76" which "includes an image of the data structure of the flash memory 10 for improving the speed with which the data segment 32 in the data files can be accessed" (Column 6, lines 12-15)]**

"reading one of said data blocks into said memory;" **[With respect to this limitation, Marshall discloses consolidating flash memory 10 "to reclaim space from file sectors 26-29 that have been discarded" by performing "asynchronous erasures" which are initiated by "a function call by a flash memory 10 file access function" (Column 7, lines 18-28)]**

"dividing said one data block into a plurality of data chunks;" **[Marshall discloses this limitation as "each erasure block of a flash memory is divided into a number of sectors" (Column 2, lines 31-37, Columns 3-4, lines and Figure 1)]**

"creating a corresponding respective flag for each of said data chunks of said data block;" **["SAT (sector allocation table)" which "includes a SAT record 25 (Fig. 5) for each of the files sectors" (Column 4, lines 31-32) and explains that "each SAT record 25 includes four bits for indicating that the corresponding file sectors 26-29 are free, active (current), pre-discarded, or discarded" (Column 4, lines 38-42 and Figure 5). Marshall also discloses that when sectors are no longer required and their space may be reclaimed by the memory management system, they are marked as "discarded" (Column 5, lines 51-54 and Column 6, lines 49-67)]**

"initialising said data flag to an "in use" status;" **[With respect to this limitation, Marshall discloses that "each erasure block 17-20 is formatted by erasing it" and then setting "BIR (block information record) 22" to a show a valid value (Column 7, lines 29-34)]**

"selecting individual data chunks of said data block for reading by said reader device; reading a block pointer of one of the selected data chunks, said block pointer pointing to said data block; processing said one selected data chunk by using said at least one test component; and applying a flag setting to said data block from which said one selected data chunk originates, said flag setting indicating that said data chunk has been processed" **[With respect to this limitation, Marshall discloses that "run time information" for "the state is kept about each erasure block 17-20" (Column 6, lines 49-52) which comprise "ready for erasure, is retired due to a failed erasure, or is valid" (Column 4, lines 10-13) and explains using "wear leveling code 74" (which comprises a form of memory testing) to consolidate "flash memory 10" in order to reclaim the discarded address space as "file sectors that are active are sparsely**

spread through the flash memory 10 because erasure blocks 17-20 contain many file sectors 26-29 that are discarded" (Column 5, lines 47-50) and explains that "in order to consolidate the file sectors 26-29 or to modify the data segment 32, the file sectors 26-29 are copied by the executable code 68 into new address space. The pre-discard code 72 includes instructions for marking the pre-discarded indicator (Fig. 5) corresponding to the file sector 26-29 before that file sector 26-29 is copied into a new address space and marking the discarded indicator corresponding to the file sector 26-29 after the copy is complete" (Columns 5-6, lines 65-67 and 1-5)].

20. As per **claim 14**, Marshall discloses

"The method as claimed in claim 13," **[See rejection to claim 13 above]** "further comprising: for each of a plurality of data chunks of said data block, maintaining a corresponding respective data flag indicating whether said data chunk is in use or not;" **[Marshall discloses this limitation as a "SAT (sector allocation table)" which "includes a SAT record 25 (Fig. 5) for each of the files sectors" (Column 4, lines 31-32) and explains that "each SAT record 25 includes four bits for indicating that the corresponding file sectors 26-29 are free, active (current), pre-discarded, or discarded" (Column 4, lines 38-42 and Figure 5). Marshall also discloses that when sectors are no longer required and their space may be reclaimed by the memory management system, they are marked as "discarded" (Column 5, lines 51-54 and Column 6, lines 49-67)]**

"in response to all of said data flags of said data block having a "not in use" status, deleting said data block from said memory" **["If all the file sectors 26-29 in the erasure**

block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56)].

21. As per **claims 16-17 and 27**, Marshall discloses

"A reader component/apparatus for reading a plurality of data chunks from a memory, said reader component comprising respective sub-components for:" **["a method and apparatus for storing data files with a flash memory" (Column 1, lines 5-7) wherein memory management is done for "wear leveling" which comprises a form of memory testing (Column 5, lines 51-64 and Column 6, lines 49-56) and explains that the present invention is applicable to any memory type where "erasures are required or desired to be done by blocks" (Column 3, lines 58-64). Marshall also discloses having "computing machine 60" which includes "executable code 68" for "using the data structure of the flash memory 10 for accessing the data files stored in the flash memory 10 and for controlling the computing machine 60" (Column 5, lines 24-40 and Figure 2) and "temporary memory 76" which "includes an image of the data structure of the flash memory 10 for improving the speed with which the data segment 32 in the data files can be accessed" (Column 6, lines 12-15)]**

"creating flags for a plurality of data chunks, said flags being arranged for indicating whether each of said data chunks is in use or not in use;" **[Marshall discloses this limitation as a "SAT (sector allocation table)" which "includes a SAT record 25 (Fig. 5) for each of the files sectors" (Column 4, lines 31-32) and explains that "each SAT record 25 includes four bits for indicating that the corresponding file sectors 26-29 are free, active (current), pre-discarded, or discarded" (Column 4, lines 38-42 and Figure 5). Marshall also discloses that when sectors are no longer required and**

their space may be reclaimed by the memory management system, they are marked as "discarded" (Column 5, lines 51-54 and Column 6, lines 49-67)]

"maintaining a data block flag, said data block flag being arranged for indicating whether the said data block is in use or not in use;" [**Marshall discloses this limitation as a "block information record (BIR)" which contains a "validity indicator;" "the validity indicator is a thirty-two bit unsigned number indicating that the erasure block 19 is ready for erasure, is retired due to a failed erasure, or is valid" (Columns 3-4)]**

"determining whether said reader device has finished reading from said data block; and generating a signal for indicating a data block from which said reader component has finished reading is to be deleted" [**Marshall discloses this concept as "in order to consolidate the file sectors 26-29 or to modify the data segment 32, the file sectors 26-29 are copied by the executable code 68 into new address space. The pre-discard code 72 includes instructions for marking the pre-discarded indicator (Fig. 5) corresponding to the file sector 26-29 before that file sector 26-29 is copied into a new address space and marking the discarded indicator corresponding to the file sector 26-29 after the copy is complete" (Columns 5-6, lines 65-67 and 1-5) and explains that If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56) by having "asynchronous erasures" which "can be initiated by a function call by a flash memory 10 file access function" (Column 7, lines 18-28)]**.

22. As per **claim 18**, this claim requires:

"means for receiving a plurality of said data blocks in said memory, each said data block comprising a plurality of data chunks;" (***Page 1, lines 23-24 of Applicant's Specification and Figure 2 identify this means as "test computer 205"***) **[With respect to this limitation, Marshall discloses "computing machine 60," "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2)]**

"means for setting a plurality of data block flags indicating whether each of said data blocks are in use or not in use by at least one program;" (***Page 10, lines 24-25 and Figure 5 of Applicant's Specification identify this means as "reader application 501"***) **[With respect to this limitation, Marshall discloses "memory management system" comprising "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2)]**

"and means for determining whether said data blocks are to be maintained in said memory or not, depending on the status of a flag indicating that said data block is in use, or is not in use by said at least one program" (***Page 10, lines 1-4 of Applicant's Specification identifies this means as "flags set by the reader application"***) **[With respect to this limitation, Marshall discloses "SAT (Sector Allocation Table)" (Column 4, lines 31-47) and "BIR (Block Information Record)" (Columns 3-4, lines 65-67 and 1-13) which are used by "processor 62," "computing machine 60," and "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2) to perform memory management functions according to the invention]**.

23. As per **claim 19** (dependent on 18) this claim requires:

"means for maintaining a plurality of data pointers for indicating, for each of a plurality of data chunks including plural data blocks, a data block from which each of said data chunks originates" (***Page 10, lines 28-30 of Applicant's Specification identifies this means as "the reader device" which reads block pointers from "memory"***) **["SAT 24 includes a SAT record 25 (Fig. 5) for each of the file sectors 26-29" (Column 4, lines 31-38); therefore, having pointers for each sector and explains that "the runtime management system 80 uses a table for a file entry 82, a file descriptor 84, and a cache 86" (Column 6, lines 46-48)]**.

24. As per **claim 20** (dependent on claim 18), this claim requires:

"means for maintaining a set of flags indicating that a reader application has finished processing one of said data blocks" (***Page 10, lines 24-25 and Figure 5 of Applicant's Specification identify this means as "reader application 501"***) **["SAT (Sector Allocation Table)" (Column 4, lines 31-47) and "BIR (Block Information Record)" (Columns 3-4, lines 65-67 and 1-13) which are used by "processor 62," "computing machine 60," and "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2) to perform memory management functions according to the invention]**.

25. As per **claim 21** (dependent on claim 18), this claim requires:

"means for maintaining a record of the number of data chunks which are currently in use in one of said data blocks" (***Page 13, lines 8-15 of Applicant's Specification identifies this means as "reader device" which maintains a "total active counter"***) **["the wear leveling code 74 includes instructions for selecting the erasure block 17-20 for reuse as follows: 1) selecting the erasure blocks 17-20 in which all the file sectors 26-29**

have been allocated; 2) from the erasure blocks 26-29 that are completely allocated, selecting the erasure blocks 17-20 with the lowest number of file sectors 26-29 that are active" (Column 5, lines 55-64); therefore, a count of required memory chunks is maintained as the active memory chunks cannot be "discarded." Then "processor 62," "computing machine 60," and "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2) are used to perform memory management functions according to the invention].

26. As per **claim 22** (dependent on claim 18), this claim requires:

"means for maintaining flag data indicating whether or not a reader application has finished data processing of a data block" " (***Page 10, lines 24-25 and Figure 5 of Applicant's Specification identify this means as "reader application 501"***) **["SAT (Sector Allocation Table)" (Column 4, lines 31-47) and "BIR (Block Information Record)" (Columns 3-4, lines 65-67 and 1-13) which are used by "processor 62," "computing machine 60," and "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2) to perform memory management functions according to the invention].**

27. As per **claim 23** (dependent on claim 18), this claim requires:

"means for generating a message to delete said data block from said memory if no further testing of said data block is required" (***Page 12 of Applicant's Specification identifies this means as "the reader device"***) **[With respect to this limitation, Marshall discloses that "If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56) by having "asynchronous erasures" which "can be initiated by a function call by a flash**

memory 10 file access function" (Column 7, lines 18-28) which are used by "processor 62," "computing machine 60," and "executable code 68" and "wear-leveling code 74" (Column 5, lines 24-40 and 51-64, Column 6, lines 49-56 and Figure 2) to perform memory management functions according to the invention].

28. As per **claims 24 and 30**, Marshall discloses

"A method/apparatus of managing a plurality of memory blocks in a memory device for testing data in said memory blocks, said method comprising:" as **["a method and apparatus for storing data files with a flash memory" (Column 1, lines 5-7) wherein memory management is done for "wear leveling" which comprises a form of memory testing (Column 5, lines 51-64 and Column 6, lines 49-56) and explains that the present invention is applicable to any memory type where "erasures are required or desired to be done by blocks" (Column 3, lines 58-64)]**

"partitioning a plurality of said memory blocks in said memory device, each of said memory block having plural memory chunks each adapted for storing a corresponding respective data chunk;" **[With respect to this limitation, Marshall discloses that "each erasure block of a flash memory is divided into a number of sectors" (Column 2, lines 31-37, Columns 3-4, lines and Figure 1)]**

"setting a plurality of flags that indicate whether data stored in each of said memory blocks are to be maintained or not maintained; and maintaining data stored in individual ones of said memory blocks having a flag indicating that said data of said memory block is to be maintained" **[Marshall discloses this limitation as a "block information record (BIR)" which contains a "validity indicator;" "the validity indicator is a thirty-two bit unsigned number indicating that the erasure block 19 is ready for**

erasure, is retired due to a failed erasure, or is valid" (Columns 3-4) and explains that "If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56); therefore, active blocks are maintained].

29. As per **claims 25 and 31**, Marshall discloses

"A method/apparatus of managing plural data blocks in a memory device, said method comprising:" as **["a method and apparatus for storing data files with a flash memory" (Column 1, lines 5-7) wherein memory management is done for "wear leveling" which comprises a form of memory testing (Column 5, lines 51-64 and Column 6, lines 49-56) and explains that the present invention is applicable to any memory type where "erasures are required or desired to be done by blocks" (Column 3, lines 58-64)]**

"creating a memory block having plural memory chunks; storing a block of data in said memory block, such that individual data chunks include in said data block are stored in said plural memory chunks;" **[With respect to this limitation, Marshall discloses that "each erasure block of a flash memory is divided into a number of sectors" (Column 2, lines 31-37, Columns 3-4, lines and Figure 1)]**

"maintaining a record of the number of active data chunks in said memory block;" **[Marshall discloses this concept as "the wear leveling code 74 includes instructions for selecting the erasure block 17-20 for reuse as follows: 1) selecting the erasure blocks 17-20 in which all the file sectors 26-29 have been allocated; 2) from the erasure blocks 26-29 that are completely allocated, selecting the erasure blocks 17-20 with the lowest number of file sectors 26-29 that are active" (Column 5, lines 55-**

64); therefore, a count of required memory chunks is maintained as the active memory chunks cannot be "discarded." Marshall also teaches maintain information for the file sectors that are free in each memory block (Column 6, lines 49-56)]

"and under conditions where the active number of data chunks in a memory block is zero, deleting all of said data blocks from said memory block" **[With respect to this limitation, Marshall discloses that "when a file sector 26-29 is discarded, the SAT 24 of the associated erasure block 19 and statistics are updated. If all the file sectors 26-29 in the erasure block 19 are now discarded, the erasure block 19 can be erased to reclaim the space" (Column 7, lines 52-56)]**.

VII. RELEVANT ART CITED BY THE EXAMINER

30. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See **MPEP 707.05(c)**.

31. The following references teaches a system/method for performing garbage collection in a flash memory including state information and an input/output unit.

U.S. PATENT NUMBER

US 2005/0166005

32. The following reference teaches erase method in a flash memory consisting of multiple sectors by using a busy state flag, and a used state flag.

U.S. PATENT NUMBER

US 2001/0034809

33. The following reference teaches flash memory management in units of groups, each consisting of multiple sectors

U.S. PATENT NUMBER

US 6,430,650

34. The following reference teaches memory management wherein sectors are divided into blocks which are independently erasable.

U.S. PATENT NUMBER

US 2004/0098534

35. The following reference teaches memory management wherein data can be written in sector-sized portions, but is deleted as erase-blocks.

U.S. PATENT NUMBER

US 2003/0043634

VIII. CLOSING COMMENTS

Conclusion

a. STATUS OF CLAIMS IN THE APPLICATION

36. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

37. Per the instant office action, claims 1-32 have received a first action on the merits and are subject of a first action non-final.

b. DIRECTION OF FUTURE CORRESPONDENCES

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

IMPORTANT NOTE

39. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Donald Sparks, can be reached at the following telephone number: Area Code (571) 272-4201.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

May 2, 2006

Yaima Campos
Examiner
Art Unit 2185

DONALD SPARKS
SUPERVISORY PATENT EXAMINER